

**Amendments to the Claims:**

This listing of claims will replace all prior versions, and listings, of claims in the application:

**Listing of Claims:**

1. (Currently amended) A method for lightpath provisioning in a reconfigurable optical network having a current topology and current resources, wherein an IP address is assigned to network addressable elements in said reconfigurable optical network, the method comprising the steps of:

- ~~assigning an IP address to network addressable elements in said reconfigurable optical network;~~
- ~~determining current topology of said reconfigurable optical network;~~
- ~~determining current resources in said reconfigurable optical network;~~
- maintaining information regarding a state of said reconfigurable optical network;
- receiving a request to create a lightpath from a source;
- selecting a route for data to be transmitted between said source and a destination based on said current resources of said reconfigurable optical network and said current topology of said reconfigurable optical network;
- generating an API call to create a lightpath, said API call comprising parameters and resultings in a message;
- forwarding said message to each network addressable element along said selected route;
- selecting an output channel at each node to be used as an input channel at a next node;
- reconfiguring an OLXC an input channel at a current node connected to said output channel at said current node; and
- receiving a response from said destination that said selected route is available.

2. (Currently amended) The method according to claim 1, ~~wherein the assigning step~~ further comprisinging the step of uniquely assigning said IP address to each network addressable element used along said route through said reconfigurable optical network according to an OLXC from which said network addressable element is sourced.

3. (Currently amended) The method according to claim 1, further wherein said ~~uniquely assigned~~ network addressable element may include one of a node, a channel and a link.

4. (Currently amended) The method according to claim 1, ~~wherein the assigning step~~ further comprisinging the step of assigning a unique IP address to a non-IP aware client.

5. (Currently amended) The method according to claim 1, ~~wherein the assigning step~~ further comprisinging the step of assigning a unique IP address to an OLXC port to which a non-IP aware client is attached.

6. (Original) The method according to claim 1, wherein said information regarding said state of said reconfigurable optical network is distributed throughout said reconfigurable optical network.

7. (Original) The method according to claim 1, wherein said information regarding said state of said reconfigurable optical network is maintained in a soft-state.

8. (Original) The method according to claim 1, further comprising the step of forwarding a control message from each IP router to configure each router's OLXC respectively in said allocated lightpath.

9. (Original) The method according to claim 1, further comprising the step of forwarding an acknowledgement from each IP router indicating that said IP router's respective OLXC has been configured.

10. (Original) The method according to claim 1, further comprising the steps of:

updating said current topology of said reconfigurable optical network; and  
updating said current resources of said reconfigurable optical network.

11. (Original) The method according to claim 1, wherein information regarding said resources of said reconfigurable optical network and information regarding said topology of said reconfigurable optical network are distributed throughout said reconfigurable optical network.

12. (Original) The method according to claim 1, wherein said current available resources of said reconfigurable optical network is determined by sending a probe message to determine available wavelengths along wavelength continuous routes.

13. (Currently amended) The method according to claim 12, wherein said probe message uses a wavelength availability vector equal to a number of said wavelengths on a first link of said selected route, said wavelength availability vector being marked at each link along said selected route indicating what wavelengths are available at each link along said selected route.

14. (Currently amended) The method according to claim 13, wherein said wavelength availability vector being returned to said first link once said selected route has been traversed.

15. (Original) The method according to claim 1, further comprising the step of selecting from among the available wavelengths using an arbitrary wavelength assignment scheme.

16. (Original) The method according to claim 1, further comprising the step of receiving a request to create a lightpath from an originator by a first-hop IP router if said first-hop IP router was not the source of said request to create a lightpath.

17. (Original) The method according to claim 1, further comprising the step of forwarding said message using an IP router alert.

18. (Original) The method according to claim 1, wherein the step of selecting a route for the data to be transmitted is performed by a first-hop router.

19. (Original) The method according to claim 1, wherein the step of selecting a route for the data to be transmitted is performed by a pre-authenticated higher-level network management system.

20. (Currently amended) The method according to claim 1, ~~wherein the step of further comprising~~ determining current topology ~~is performed~~ via OSPF link state advertisement.

21. (Original) The method according to claim 1, further comprising the step of carrying said selected route in an IP datagram using an IP source route option.

22. (Original) The method according to claim 1, further comprising the step of carrying said selected route in packet payload.

23. (Original) The method according to claim 1, wherein said selected route is specified as a series of nodes.

24. (Original) The method according to claim 1, wherein said selected route is specified as a series of links.

25. (Original) The method according to claim 1, wherein said selected route is specified as a series of nodes and links.

26. (Original) The method according to claim 1, wherein said current topology and resources comprise:

a total number of active channels;

a number of allocated channels;

a number of preemptable channels;

a number of reserved restoration channels;

Shared Risk Link Groups throughout the reconfigurable optical network;

and

optional physical layer parameters for each link.

27. (Currently amended) A method for lightpath provisioning in a reconfigurable optical network having a current topology and current resources, wherein an IP address is assigned to network addressable elements in said reconfigurable optical network, the method comprising the steps of:

~~assigning an IP address to network addressable elements in said reconfigurable optical network;~~

~~determining current topology of said reconfigurable optical network;~~

~~determining current resources in said reconfigurable optical network;~~

maintaining information regarding a state of said reconfigurable optical network;

receiving a request to create a lightpath from a source;

selecting a route for data to be transmitted between said source and a destination based on said current resources of said reconfigurable optical network and said current topology of said reconfigurable optical network;

generating an API call to create a lightpath, said API call comprising parameters and resultings in a message;

forwarding said message to each network addressable element along said selected route;

selecting an output channel at each node to be used as an input channel at a next node;

reconfiguring an OLXC as input channel at a current node connected to said output channel at said current node;

receiving a response from said destination that said selected route is not available; and

releasing resources configured along a partially created lightpath.

28. (Currently amended) The method according to claim 427, wherein said response is accomplished using an ICMP message.

29. (Currently amended) The method according to claim 427, wherein said response is accomplished using a CR-LDP message.

30. (Currently amended) The method according to claim 427, wherein said response is accomplished using a RSVP message.

31. (Currently amended) A method for lightpath provisioning in a reconfigurable optical network comprising the steps of:

naming each network addressable element in said reconfigurable optical network;

determining current topology in said reconfigurable optical network;

determining current resources in said reconfigurable optical network;

requesting establishment of a lightpath via an API call comprising parameters; and  
allocating said lightpath.

32. (Currently amended) A system for lightpath provisioning in a reconfigurable optical network having a current topology and current resources, wherein an IP address is assigned to each network addressable element in said reconfigurable optical network, comprising:

~~means for assigning an IP address to each network addressable element in said reconfigurable optical network;~~

means for receiving a request to create a lightpath from a source;

~~means for determining current topology of said reconfigurable optical network;~~

~~means for determining current resources in said reconfigurable optical network;~~

means for maintaining information regarding a state of said reconfigurable optical network;

means for selecting a route for data to be transmitted between said source and a destination based on said current resources of said reconfigurable optical network and said current topology of said reconfigurable optical network;

means for generating an API call to create a lightpath, said API call comprising parameters and resultings in a message;

means for forwarding said message to each network addressable element along said selected route;

means for selecting an output channel at each node to be used as an input channel at a next node;

means for reconfiguring an OLXC an input channel at a current node connected to said output channel at said current node; and

means for receiving a response from said destination that said selected route is available.

33. (Currently amended) The system according to claim ~~432~~, wherein ~~the means for assigning~~ further comprisinges means for uniquely assigning said IP address to each network addressable element used along said route through said reconfigurable optical network according to an OLXC from which said channel is sourced.

34. (Currently amended) The system according to claim ~~432~~, further wherein said ~~uniquely assigned~~ network addressable element may include a node, a channel and a link.

35. (Currently amended) The system according to claim ~~432~~, wherein ~~said means for assigning~~ further comprisinges means for assigning a unique IP address to a non-IP aware client.

36. (Currently amended) The system according to claim ~~432~~, wherein ~~said means for assigning~~ further comprisinges means for assigning a unique IP address to an OLXC port to which a non-IP aware client is attached.

37. (Currently amended) The system according to claim ~~432~~, wherein said information regarding said state of said reconfigurable optical network is distributed throughout said reconfigurable optical network.

38. (Currently amended) The system according to claim ~~432~~, wherein said information regarding said state of said reconfigurable optical network is maintained in a soft-state.

39. (Currently amended) The system according to claim ~~432~~, further comprising means for forwarding a control message from each IP router to configure each router's OLXC respectively in said allocated lightpath.



40. (Currently amended) The system according to claim 432, further comprising means for forwarding an acknowledgment from each IP router indicating that said IP router's respective OLXC has been configured.

41. (Currently amended) The system according to claim 432, further comprising:

means for updating said current topology of said reconfigurable optical network; and

means for updating said current resources of said reconfigurable optical network.

42. (Currently amended) The system according to claim 432, wherein information regarding said resources of said reconfigurable optical network and information regarding said topology of said reconfigurable optical network are distributed throughout said reconfigurable optical network.

43. (Currently amended) The system according to claim 432, wherein said current topology of said reconfigurable optical network is determined by sending a probe message to determine available wavelengths along wavelength continuous routes.

44. (Currently amended) The system according to claim 443, wherein said probe message uses a wavelength availability vector equal to a number of said wavelengths on a first link of said selected route, said wavelength availability vector being marked at each link along said selected route indicating what wavelengths are available at each link along said selected vector.

45. (Currently amended) The system according to claim 444, said wavelength availability vector is returned to said first link once said selected route has been traversed.

46. (Currently amended) The system according to claim 432, further comprising means for selecting from among the available wavelengths using an arbitrary wavelength assignment scheme.

47. (Currently amended) The system according to claim 432, further comprising means for receiving a request to create a lightpath from an originator by a first-hop IP router if said first-hop IP router was not the source of said request to create a lightpath.

48. (Currently amended) The system according to claim 432, further comprising means for forwarding said message using an IP router alert.

49. (Currently amended) The system according to claim 432, wherein the means for selecting a route for the data to be transmitted is performed by a first-hop router.

50. (Currently amended) The system according to claim 432, wherein the means for selecting a route for the data to be transmitted is performed by a pre-authenticated higher-level network management system.

51. (Currently amended) The system according to claim 432, ~~wherein the step of determining current topology~~ further comprising means for performing is performed via OSPF link state advertisements.

52. (Currently amended) The system according to claim 432, further comprising means for carrying said selected route in an IP datagram using an IP source route option.

53. (Currently amended) The system according to claim 432, further comprising means for carrying said selected route in packet payload.

54. (Currently amended) The system according to claim 432, wherein said selected route is specified as a series of nodes.

55. (Currently amended) The system according to claim 432, wherein said selected route is specified as a series of links.

56. (Currently amended) The system according to claim 432, wherein said selected route is specified as a series of nodes and links.

57. (Currently amended) The system according to claim 432, wherein said current topology and resources comprises:

a total number of active channels;

a number of allocated channels;

a number of preemptable channels;

a number of reserved restoration channels;

Shared Risk Links Groups throughout the reconfigurable optical network;

and

optional physical layer parameters for each link

58. (Currently amended) A system for lightpath provisioning in a reconfigurable optical network having a current topology and current resources, wherein each network addressable element in said reconfigurable optical network is assigned an IP address, comprising:

—— means for assigning an IP address to each network addressable element in said reconfigurable optical network;

—— means for determining current resources in said reconfigurable optical network;

—— means for determining current topology of said reconfigurable optical network;

means for receiving a request to create a lightpath from a source;

means for maintaining information regarding a state of said reconfigurable optical network;

means for selecting a route for data to be transmitted between said source and a destination based on said current resources of said reconfigurable optical network and said current topology of said reconfigurable optical network;

means for generating an API call to create a lightpath, said API call comprising parameters and resultings in a message;

means for forwarding said message to each network addressable element along said selected route;

means for selecting an output channel at each node to be used as an input channel at a next node;

means for reconfiguring an OLXC an input channel at a current node connected to said output channel at said current node;

means for receiving a response from said destination that said selected route is not available; and

means for releasing resources allocated along a partially created lightpath.

59. (Currently amended) The system according to claim 458, wherein said response is accomplished using an ICMP message.

60. (Currently amended) The system according to claim 458, wherein said response is accomplished using a CR-LDP message.

61. (Currently amended) The method according to claim 458, wherein said response is accomplished using a RSVP message.

62. (Currently amended) A system for lightpath provisioning in a reconfigurable optical network comprising:

means for naming each network addressable element in said reconfigurable optical network;

means for determining current topology in said reconfigurable optical network;

means for determining current resources in said reconfigurable optical network;

means for requesting establishment of a lightpath via an API call comprising parameters; and

means for allocating said lightpath.

63. (Canceled)

64. (Currently amended) A method for removing a lightpath in a reconfigurable optical network comprising the steps of allowing said lightpath to be released by expiration as a result of a soft-state, wherein said soft-state fails to timely forward a message to create said lightpath in order to maintain said lightpath before expiration of a time-to-live value.

65. (Canceled)

66. (Currently amended) A system for removing a lightpath in a reconfigurable optical network comprising means for allowing said lightpath to be released by expiration as a result of a soft-state, wherein said soft-state fails to timely forward a message to create said lightpath in order to maintain said lightpath before expiration of a time-to-live value.